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Effective on 12/08/2004.
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FEE TRANSMITTAL For FY 2005

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT	($) 500.00

Complete if Known	
Application Number	10/728,871
Filing Date	December 8, 2003
First Named Inventor	Jobst Gellert et al.
Examiner Name	Kevin P. Kerns
Art Unit	1725
Attorney Docket No.	MMID 449

METHOD OF PAYMENT (check all that apply)

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FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

Application Type	FILING FEES Fee ($)	FILING FEES Small Entity Fee ($)	SEARCH FEES Fee ($)	SEARCH FEES Small Entity Fee ($)	EXAMINATION FEES Fee ($)	EXAMINATION FEES Small Entity Fee ($)	Fees Paid ($)
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee ($)	Small Entity Fee ($)
Each claim over 20 or, for Reissues, each claim over 20 and more than in the original patent	50	25
Each independent claim over 3 or, for Reissues, each independent claim more than in the original patent	200	100
Multiple dependent claims	360	180

Total Claims	Extra Claims	Fee ($)	Fee Paid ($)
_____ - 20 or HP =	_____ x	50.00 =	0.00

HP = highest number of total claims paid for, if greater than 20

Indep. Claims	Extra Claims	Fee ($)	Fee Paid ($)
_____ - 3 or HP =	0 x	200.00 =	0.00

HP = highest number of independent claims paid for, if greater than 3

Multiple Dependent Claims Fee ($)	Fee Paid ($)
0.00	0.00

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee ($)	Fee Paid ($)
_____ - 100 =	0 / 50 =	0 (round **up** to a whole number) x	_____ =	

4. OTHER FEE(S)

	Fees Paid ($)
Non-English Specification, $130 fee (no small entity discount)	
Other: Appeal Brief	500.00

SUBMITTED BY

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	Confirmation No.: 1170
Gellert *et al.*	Art Unit: 1725
Appl. No.: 10/728,871	Examiner: Kevin P. Kerns
Filed: December 8, 2003	Atty. Docket: MMID 449
For: **Manifold With Film Heater**	

Appeal Brief Under 37 C.F.R. § 41.37

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

This is an appeal pursuant to 35 U.S.C. § 134 from the Examiner's decision rejecting claims 1-12 and 15 as set forth in the Final Office Action mailed February 28, 2005. This Appeal Brief is presented in the format set forth in 37 C.F.R. § 41.37 and is accompanied by the fee set forth in 37 C.F.R. § 41.20(b)(2).

I. Real Party in Interest

The Real Party in Interest in the above-referenced application is Mold-Masters Limited by virtue of the assignment from the inventors to Mold-Masters Limited recorded at reel 015255, frame 0240.

II. Related Appeals and Interferences

There are no appeals or interferences related to this appeal.

III. Status of Claims

Claims 1-12 and 15 stand finally rejected and are the subject of this appeal.

Claims 13, 14, 16, and 17 stand objected to as being dependent upon a rejected base claim, the Examiner indicating that these claims would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

IV. Status of Amendments

No amendments were filed subsequent to the final rejection.

V. Summary of Claimed Subject Matter

Independent claim 1 recites a hot runner injection molding apparatus (FIG. 1, item M; FIG. 17, item M'''; page 7, lines 21-22; page 14, lines 2-3) comprising a melt conveying system, at least one mold cavity (FIG. 1, item 16; page 7, lines 21-25), and a manifold heater (figs. 17 and 18, items 50''' and 300; page 14, lines 2-19). The melt conveying system includes a melt distribution manifold (FIG. 1, item 28; FIG. 17, item 28'''; page 8, lines 4-11; page 14, lines 2-3) having at least one melt passage (figs. 1 and 17, item 12; page 8, lines 11-15; page 14, lines 5-7) for transferring melt from a source of pressurized melt (page 14, lines 4-7; page 15, lines 15-17), and at least one injection nozzle (FIG. 1, item 10; FIG. 17, item 10'''; page 7, lines 22-24; page 14, 5-7) having a melt bore (FIG. 1, item 42; page 8, lines 13-15) therethrough, the melt bore in fluid communication with the at least one manifold melt passage. The mold cavity is adjacent the at least one nozzle and is in fluid communication with the melt bore of the at least one nozzle. The manifold heater includes a planar film heating element (FIGS. 17-19, item 302; page 14, lines 7-15) coupled to a manifold heater plate (FIG. 17, item 50'''; page 14, lines 12-13), wherein said manifold heater plate is connected to an exterior surface (FIG. 17; page 14, lines 2-5 and 15-19) of the melt distribution manifold to provide heat to melt in said at least one melt passage.

Independent claim 7 recites a combination of a melt distribution manifold for an injection molding apparatus (FIG. 1, item M; FIG. 17, item M'''; page 7, lines 21-22; page 14, lines 2-3) and a manifold heater comprising a melt distribution manifold (FIG.

1, item 28; FIG. 17, item 28'''; page 8, lines 4-11; page 14, lines 2-3) having at least one melt passage (figs. 1 and17, item 12; page 8, lines 11-15; page 14, lines 5-7) for transferring melt from a source of pressurized melt (page 14, lines 4-7; page 15, lines 15-17) to at least one injection nozzle (FIG. 1, item 10; FIG. 17, item 10'''; page 7, lines 22-24; page 14, 5-7), and a manifold heater (figs. 17 and 18, items 50''' and 300; page 14, lines 2-19) that includes a planar film heating element (figs. 17-19, item 302; page 14, lines 7-15), wherein said film heating element is connected to an exterior surface (FIG. 17; page 14, lines 2-5 and 15-19) of said melt distribution manifold to provide heat to melt in said at least one melt passage.

VI. Grounds of Rejection to be Reviewed on Appeal

Claims 1-3, 5, 7-9, 11 and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,648,546 to Gellert ("Gellert") in view of U.S. Patent No. 5,973,296 to Juliano *et al.* ("Juliano *et al.*") and further in view of U.S. Patent No. 5,569,474 to Kitaichi *et al.* ("Kitaichi *et al.*").

Claims 4, 6, 10, and 12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Gellert in view of Juliano *et al.* and further in view of Kitaichi *et al.*, as applied to claims 1 and 7, and further in view of U.S. Patent No. 6,305,923 to Godwin *et al.* ("Godwin *et al.*").

VII. Argument

A. Rejection of claims 1-3, 5, 7-9, 11 and 15 under 35 U.S.C. § 103(a) based upon the combined teachings of Gellert, Juliano *et al.* and Kitaichi *et al.*

Independent claims 1 and 7 are patentable over Gellert, Juliano *et al.*, and Kitaichi *et al.* because there is no motivation to combine the references and, even if combined, the claimed invention would not be achieved.

First, there is no motivation to combine the Gellert, Juliano *et al.*, nor Kitaichi *et al.* patents to arrive at Applicants' claimed invention. Gellert teaches embedding an electrical heating element (item 58) in a channel (item 56) milled in an upper surface (item 54) of ***a manifold***. (Gellert patent, col. 4, lines 39-41; FIGS. 4-6). The heating element is recessed into the manifold surface and metallurgically bonded therein "to disperse heat rapidly away from the [heating] element 58 [that] avoids the creation of hot spots along the heating element and applies the heat more uniformly along the melt passage 12". (Gellert patent, col. 5, lines 29-32 and 39-45; FIG. 6). Juliano *et al.* teach a tubular heating sheath (6) for sliding over ***a tubular nozzle body***, wherein a spirally wound resistive wire element (item 8 in FIG. 1, see also FIG. 2B) is replaced by a thick film tubular heater (item 40 in FIG. 2A). (Juliano *et al.* patent, col. 5, lines 42-46; col. 6, lines 5-8). As shown in Figs. 4, 4A and 4B, the Juliano *et al.* thick film tubular heater core (item 48) is coaxially disposed about the tubular nozzle body (item 32). (Juliano patent, col. 6, lines 37-47). According to Juliano *et al.*, such a nozzle heater arrangement reduces the bulkiness of the nozzle and decreases the size of the nozzle. (Juliano patent, col. 1, lines 45-66). As such, there would be no motivation to one of ordinary skill in the art to modify ***an embedded manifold heater*** as disclosed in the Gellert patent with ***a thick film tubular nozzle heater*** as disclosed in the Juliano patent to arrive at the Applicants' claimed invention. Particularly, the problem to be solved by a smaller profile tubular nozzle heater as disclosed in Juliano is not relevant to an embedded manifold heater as disclosed in Gellert. Each of the "motivations" proposed by the Examiner are merely a restatement of the objects of the invention set forth in Juliano *et al.*, except that the Examiner ignored that the objects of the Juliano *et al.* invention are concerned with heating a ***tubular*** object, that is, a tubular nozzle. In fact, the entire Juliano *et al.* patent

is concerned with a non-flat or tubular thick film resistive element. The teachings of a prior art reference must be taken as a whole.

Further, one of ordinary skill in the art would not have been motivated to combine the teachings of Kitaichi *et al.* with the teachings of Gellert and Juliano *et al.* Kitaichi *et al.* discloses a thin film electric resistor (10) formed on a wall surface of ***a mold cavity*** that contacts the molten plastics (9) to heat the molten plastics (9) ***directly.*** (col. 10, lines 21-24 and 35-38). Thus, the thin film electric resistor of Kitaichi *et al.* is disposed on an ***interior*** surface of the ***mold cavity***. Kitaichi does not teach or suggest mounting a thin film electric resistor to a ***manifold,*** nor does it teach or suggest mounting such a thin film electric resistor to an ***exterior*** surface of a manifold. The Examiner asserts it would have been obvious to one of ordinary in the art to add "the planar film heater along a mold manifold, as disclosed by Kitaichi et al., in order to provide rapid surface heating for a mold used for injection molding of plastics, such that defects in the molded product occur less frequently." Final Office Action, p. 4, lines 15-17. However, as noted above, the Kitaichi *et al.* patent teaches that the purported benefit of less frequent defects in a molded product occurs when the thin film electric resistor is provided on an interior wall surface of the mold ***into*** which the molten plastic is injected such that there is a ***direct*** heat exchange between the heat source and the molten plastic. (Col. 5, lines 12-16). Thus, one of ordinary skill in the art would not have been motivated by Kitaichi *et al.* to modify the externally heated manifold of Gellert or the externally heated nozzle of Juliano *et al.*[1]

[1] Applicants note that the Examiner asserted that Juliano *et al.* teach that the thick film resistive heater may be disposed on the inside of the nozzle. (Final Office Action, p. 3, lines 9-10). Applicants believe that the Examiner is relying on FIG. 4B of Juliano *et al.* for such a teaching. However, FIG. 4B of Juliano *et al.* discloses that the thick film

Further, even if one of ordinary skill in the art would have been motivated to combine the teachings of Kitaichi *et al.* with Gellert and Juliano *et al.*, such a person of ordinary skill in the art would not have been motivated to place a thin film resistor on an ***exterior*** surface of a manifold. As noted above, Kitaichi *et al.* teach that the thin film electric resistor should be in ***direct contact*** with the molten plastic flowing into the mold cavity. Kitaichi *et al.* further teach that a thin film resistor heats ***only*** the surface of an object rapidly. (Col. 3, lines 65-66). Thus, one of ordinary skill in the art relying upon Kitaichi would not have been motivated to place a thin film electric resistor on an ***exterior*** surface of a manifold because the thin film resistor would not be in ***direct*** contact with the molten plastic and only the ***exterior*** surface of the manifold would be heated rapidly. Since the molten plastic running through the manifold is what needs to heated, heating only the exterior surface would not be sufficient.

Thus, one of ordinary skill in the art would not have been motivated to modify the heater of Gellert based on the teachings of Kitaichi *et al.*, and even if so motivated, one of ordinary skill in the art would not have used the thin film electric resistor of Kitaichi *et al.* on an exterior surface of the manifold, as recited in independent claims 1 and 7.

Claim 2, 3, 5, 8, 9, 11, and 15 depend directly or indirectly from independent claim 1 or independent claim 7, and are therefore allowable over the references cited for at least the same reasons as independent claims 1 and 7.

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resistive heater is disposed on an ***outside*** surface of the tubular body (32). Thus, Juliano *et al.* does not support the Examiner's assertion.

B. Rejection of claims 4, 6, 10, and 12 under 35 U.S.C. § 103(a) based on the combined teachings of Gellert, Juliano *et al.*, Kitaichi *et al.*, and Godwin *et al.*

1. Argument for claims 4 and 10

Claim 4 depends from independent claim 1 and recites that the "manifold heater includes a wire heater element." Similarly, claim 10 depends from independent claim 7 and recites that the "manifold heater includes a wire heater element." These claims are allowable over the cited references for at least the same reasons as independent claims 1 and 7.

Further, the Examiner relies on Godwin *et al.* for teaching the use of an **additional** wire heater at the exit of the manifold, as shown in FIG. 20 of Godwin *et al.* However, claims 4 and 10 recite that the already recited manifold heater includes a wire heater element. This element of claims 4 and 10 is shown in FIG. 19 of the present application, wherein the heater element (308) is shown as part of the thin film heater. Thus, claims 4 and 10 are not reciting an additional wire heater, but a wire heater element as part of the already claimed manifold heater. The conventional manifold heater (205) of Godwin *et al.* does not include such a wire heater element.

2. Argument for claims 6 and 12

Claim 6 depends from independent claim 1 and recites that the "film heating element includes a wire heater element and a thermocouple element connected to said film heating element." Similarly, claim 12 depends from independent claim 7 and recites that the "film heating element includes a wire heater element and a thermocouple element connected to said film heating element." These claims are allowable over the cited references for at least the same reasons as independent claims 1 and 7.

Further, the Examiner relies on Godwin *et al.* for teaching the use of an additional wire heater at the exit of the manifold, as shown in FIG. 20 of Godwin *et al.* However, claims 6 and 12 recite that the "film heating element" includes a wire heater element and a thermocouple element. These elements of claims 6 and 12 are shown in FIG. 19 of the present application, wherein the heater element (308) and thermocouple element (310) are shown as part of the thin film heater (302). The conventional manifold heater (205) of Godwin *et al.* does not include a wire heater or a thermocouple as part of the thin film heater, as recited in claims 6 and 12.

For the foregoing reasons, the Examiner's rejections of claims 1-12 and 15 should be reversed.

Respectfully submitted,

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Appendix of Claims

1. A hot runner injection molding apparatus comprising:

(a) a melt conveying system, said system having,

(i) a melt distribution manifold having at least one melt passage for transferring melt from a source of pressurized melt, and,

(ii) at least one injection nozzle having a melt bore therethrough, said melt bore in fluid communication with said at least one manifold melt passage;

(b) at least one mold cavity adjacent said at least one nozzle, said mold cavity in fluid communication with said melt bore of said at least one nozzle; and

(c) a manifold heater, wherein said manifold heater includes a planar film heating element coupled to a manifold heater plate, wherein said manifold heater plate is connected to an exterior surface of said melt distribution manifold to provide heat to melt in said at least one melt passage.

2. An injection molding apparatus as claimed in claim 1, wherein said manifold heater includes a dielectric layer between said film heating element and said manifold heater plate.

3. An injection molding apparatus as claimed in claim 1, wherein said film heating element has an inner face that faces towards said melt distribution manifold, and wherein said film heating element has an outer face, and said manifold heater includes an insulation layer that is positioned on said outer face.

4. An injection molding apparatus as claimed in claim 1, wherein said manifold heater includes a wire heater element.

5. An injection molding apparatus as claimed in claim 1, wherein said manifold heater includes a thermocouple element connected to said film heating element.

6. An injection molding apparatus as claimed in claim 1, wherein said film heating element includes a wire heater element and a thermocouple element connected to said film heating element.

7. A combination of a melt distribution manifold for an injection molding apparatus and a manifold heater comprising:

a melt distribution manifold having at least one melt passage for transferring melt from a source of pressurized melt to at least one injection nozzle; and

a manifold heater that includes a planar film heating element, wherein said film heating element is connected to an exterior surface of said melt distribution manifold to provide heat to melt in said at least one melt passage.

8. A combination as claimed in claim 7, wherein said manifold heater includes a dielectric layer that is adapted to be positioned between said film heating element and said melt distribution manifold.

9. A combination as claimed in claim 7, wherein said film heating element has an inner face that is adapted to face towards said melt distribution manifold, and wherein

said film heating element has an outer face, and said manifold heater includes an insulation layer that is positioned on said outer face.

10. A combination as claimed in claim 7, wherein said manifold heater includes a wire heater element.

11. A combination as claimed in claim 7, wherein said manifold heater includes a thermocouple element connected to said film heating element.

12. A combination as claimed in claim 7, wherein said film heating element includes a wire heater element and a thermocouple element connected to said film heating element.

13. The injection molding apparatus of claim 1, wherein said manifold heater plate is made of a parent material that is at least partially infiltrated with a second material having a different thermal conductivity than the parent material.

14. The injection molding apparatus of claim 13, wherein the thermal conductivity of the second material is higher than the thermal conductivity of the parent material.

15. The combination of claim 7, wherein said film heating element is coupled to a manifold heater plate and said manifold heater plate is connected to the exterior surface of said melt distribution manifold.

16. The combination of claim 15, wherein said manifold heater plate is made of a parent material that is at least partially infiltrated with a second material having a different thermal conductivity than the parent material.

17. The combination of claim 16, wherein the thermal conductivity of the second material is higher than the thermal conductivity of the parent material.